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"Putting the Occupation Back in Occupational Therapy:" A Survey of Occupational Therapy Practitioners' Use of Gardening as an Intervention

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Abstract

Background. This study examines how and why occupational therapy practitioners across practice areas use gardening as an intervention. Respondents' interpretation of the best and least desirable aspects of their facility's garden and whether they contributed to its design was also examined.

Method. A description and link to a 15-question online survey about gardening as an occupational therapy intervention was emailed to Western Michigan University Occupational Therapy alumni and posted on four OT Connections groups and the AOTA LinkedIn site.

Results. Gardening as an occupational therapy intervention is meaningful and purposeful (93.66%, n = 56), motivating (80%, n = 48), fun 61.67% (n = 37), and client-centered (31.67%, n =19). Frequency of gardening as a therapeutic intervention and practitioner involvement in designing the garden was significant (p = .007), suggesting that for respondents, environmental context supports engagement and heightens the meaningfulness and purposefulness of gardening.

Conclusion. Based on results of this study, a suggested next step is evidence-based translational and intervention research to validate the efficacy of gardening as an occupational therapy intervention and occupational therapy practitioners' professional value as implementers of such intervention. Assessing the effectiveness of the role of occupational therapy practitioners in facility garden design is also important to consider.

Keywords

Occupational Therapy Practitioners' Use of Gardening as an Intervention

Cover Page Footnote

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Credentials Display

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Background and Literature Review

Gardening is the "activity of tending and cultivating" plants (Gardening News, 2011). The meaning that people derive from their interactions with plants determines its efficacy (Fieldhouse, 2003). Gardening is holistic; it requires cognition to plan and sequence, physical skills to tend, and emotion to be invested in the process. Gardening promotes engagement and responsibility and stimulates curiosity (Tse, 2010) and is an "elegantly simple and inexpensive approach to mental wellness promotion" (Grabbe, Ball, & Goldstein, 2013, p. 265). Gardening provides ample opportunities for occupational engagement; for planting, tending, harvesting, and making use of the harvest (Matuska, 2013). As an occupational therapy intervention, it is sustainable and supports healthy eating, exercise, elevation of mood, and social engagement.

Gardening as Occupation

The occupational therapy profession is well acquainted with using gardening as a therapeutic intervention. As far back as 1932, the positive implications of interacting with plants have been acknowledged in the occupational therapy literature (Clark, 1950; Hartwell, 1933; Southcott, 1951), and early archival photographs clearly demonstrate patients engaged in these activities. Farms and gardens adjacent to hospitals and other care and correctional facilities have long been in existence and have provided the environment and context for meaningful engagement in occupation, production, and socialization (Sempik, 2010).

Using the search terms "occupational therapy and gardening," an online search of the PubMed database found a total of 30 references, 10 of which were published in peer-reviewed journals and directly pertained to studies of occupational therapy and gardens/gardening-related interventions. An online search of the PsycInfo database using the same search terms identified above yielded a total of 20 references. Ten pertained directly to peer-reviewed occupational therapy studies of gardens/gardening-related interventions. Four articles in the PsycInfo database were not identified in the PubMed database. A review of the Academic OneFile database found 11 total references, six of which directly pertained to studies of occupational therapy and gardens/gardening-related interventions and one of which was not found in PubMed or PsycInfo. These 14 peer-reviewed articles spanned the last 75-plus years, with an overwhelming majority published within the last two decades.

For some, gardening is a meaningful, purposeful, and goal-oriented activity (Hewitt, Watts, Hussey, Power, & Williams, 2013). The steps that one follows to pot up a plant or to weed a garden bed are repetitive and goal-oriented. Repetitive and purposeful activity has the powerful potential to remediate motor function (Gillen, 2013). Interventions that are effective in improving occupational performance can be described as, "practicing, doing, active, activity, repetitive, life related, skill building, and relearning" (Gillen, 2013, p. 645). This describes gardening, as for some it fulfills the inherent human need for

engagement in tasks that provide meaning, purpose, and shape to their lives.

Occupation is an inherent part of humanity. There is a positive relationship between occupational engagement and health and well-being (Reid, 2011). Conversely, occupational deprivation occurs when an individual lacks opportunities, be they self or environmentally imposed, to engage in meaningful activity (Wilcock, 1998). To be denied the opportunity to engage in meaningful occupation compromises health and well-being (Wilcock, 1998).

A sense of belonging to a group can facilitate social inclusion when individuals are engaged in meaningful and purposeful occupations (Diamant & Waterhouse, 2010). Belonging is the "interpersonal connection of people to each other as they engage in occupation" (Hewitt et al., 2013, p. 356). Isaksson, Lexell, and Skär (2007) suggest that social support is an effective and motivating rehabilitation strategy to increase participation in meaningful occupation and to support a sense of health and resilience. Meaningful human interactions factor significantly in resilience and sense of mastery (Grabbe et al., 2013). Social interaction is critical for experiencing well-being. It is a basic need of all humans.

Expanding on the idea that social interaction is an important component of well-being one step further entails introducing the biophilia hypothesis. The basic premise of biophilia is that humans are innately drawn to the natural world, which includes, for example, plants, animals, and water (Wilson, 1984). For an individual who derives pleasure from gardening, being deprived of the opportunity to connect with plants may have a negative and enduring effect on his or her health. It has been suggested that the well-being and positive health effects of gardening are, in part, attributable to the sense of belonging it provides (York & Wiseman, 2012). Gardening can increase health and well-being through its capacity to support belonging and inclusion in that it fosters opportunities for interpersonal connections through the common purpose of growing and tending to plants in the company of others. It is also a conduit to connect with the natural world. Choice and self-determination can be nurtured through instilling a sense of inclusion and a feeling of belonging to the garden (Diamant & Waterhouse, 2010). Based on their inherent capacity to be meaningful, purposeful, and socially inclusive, gardening activities are readily adaptable for dyadic practitioner/client or larger group intervention.

Gardening as Occupation-Based Intervention and its Potential for Research

Fieldhouse contends that, "occupational therapy should emerge from a study of occupation" (Hocking & Wright-St. Clair, 2011, p. 287). Gardening is considered to be an occupation, as are the activities associated with work, leisure, play, rest, and sleep (American Occupational Therapy Association [AOTA], 2014). Gardening as an occupation-based intervention has reach in its applicability to a wide range of clients, is flexible in how it can be implemented, does not require advanced training to carry out, and can be cost efficient. It is practical and readily translatable to

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multiple practice settings. Arguably then, gardening as an occupational therapy intervention meets the criteria of being workable and having reach. Based on established and emerging evidence supporting the health benefits associated with access to nature, it may be considered that gardening as an occupation-based intervention is well suited for rigorous research with evidence-based outcomes translated into every day practice.

While there is increasing interest in measuring the effectiveness of gardening as a therapeutic intervention across professions, the scope of the research is limited (Clatworthy, Hinds, & Camic, 2013). Further, there is limited evidence produced by occupational therapy practitioners supporting gardening as an occupation, despite its historic roots and continued use. Much of what has been published is self-report and qualitative, with few randomized control trial experiments (Clatworthy et al., 2013; York & Wiseman, 2012). There is an immediate opportunity to bring occupational therapy researchers and practitioners together to generate much needed evidence-based research that is translatable to practice.

Benefits of Gardening: Research Findings

Occupational therapy is built upon the recognition that meaningful occupation contributes to health and well-being (AOTA, 2014). The health and wellness benefits associated with gardening include reduced stress on the autonomic nervous system, improved attention and physical capacity, a greater sense of self-satisfaction, diminished aggressive behavior, and improved positive social interaction (Herzog, Maguire, & Nebel, 2003; Van Den Berg & Custers, 2011). Community gardening supports resilience, reduces isolation, and increases social connectivity (Okvat & Zautra, 2011).

Gardening has been equated with positive health outcomes for individuals with physical and mental health issues. The psychological and spiritual benefit of a structured gardening intervention for older adults was shown to transcend socioeconomic, educational, and cultural boundaries and to be a cost-effective therapeutic option (Heiliker, Chadwick, & Connell, 2001). A study of 28 patients with depression showed a lasting reduction in depression and rumination, and an increase in attention following engagement in nature-based gardening activities (Gonzalez, Hartig, Patil, Martinsen, & Kirkevold, 2010). A qualitative exploration of gardening as a means to promote positive mental health for women living in a homeless shelter provided stress release, distraction and diversion, autonomy, personal growth, and purpose for the participants (Grabbe et al., 2013). The efficacy of a natural environment intervention for 157 women with newly diagnosed breast cancer showed that when participants spent, at minimum, two hours per week outdoors from the point of pretreatment through posttreatment, their attentional capacity increased (Cimprich & Ronis, 2003). Results of a longitudinal occupational therapy-directed semi-structured interview study of four women with identified psychiatric disorders found that an increase in participation in daily activities and occupational balance occurred after engaging in occupational therapy in a protective garden environment (Eriksson, Westerberg, & Jonsson,

2011). The garden milieu provided a supportive backdrop for reflection and recovery (Eriksson et al., 2011).

In many occupational therapy treatment plans, finding a treatment modality that will motivate an individual to participate is a principal goal. For patients rehabilitating poststroke, it was found that a peaceful garden setting designed with curved pathways and natural stimuli provided both an introduction to the patient's goal of outdoor rehabilitation and a less threatening and more motivating environment than long-term care facility hallways and clinics (Detweiler & Warf, 2005). Patients' experiences of working in a training garden while receiving occupational therapy services after neurological damage were studied and the results revealed that activities in a training garden were experienced as beneficial and productive (Jonasson, Marklund, & Hildingh, 2007). Results of an interdisciplinary indoor gardening program for individuals with Huntington's disease revealed that characteristics associated with Huntington's, such as perseveration, were allayed through participation in the program (Spring et al., 2011). Exercising for a minimum of twenty minutes a week, including physical activities, such as gardening, appears to be associated with better mental health and reduced risk of cognitive decline (Hamer, Stamatakis, & Steptoe, 2009). Repeated engagements in high-intensity, heavy-work gardening tasks are strong predictors for strong bone density among older women in the United States (Turner, Bass, Ting, & Brown, 2002). A study of the effectiveness of an indoor gardening program to reduce isolation and self-satisfaction of older adults living in nursing homes in Hong Kong found significant improvement in the experimental group, indicating that gardening as a meaningful activity has a significant and persistent positive influence on mood, life satisfaction, connection, and self-care. Structured gardening interventions may positively impact the mood and cognitive status of individuals with young onset dementia (Hewitt et al., 2013). Older adults with dementia who participated in structured horticulture programs showed improvements in levels of productive engagement, self-care, emotional affect, and cooperativeness with staff at nursing facilities (Gigliotti & Jarrott, 2005; Park, Yamane, Yamaki, & Takahashi, 2008).

Results of an after school gardening program implemented in a highly marginalized county in Alabama's "black belt" region found that participation in the program positively influenced children's academic performance, behaviors, focus, concentration, and curiosity (McArthur, Hill, Trammel, & Carlton, 2010). Studies indicate that participation in school gardening may positively impact children's rate and variety of vegetable consumption (Ratcliffe, Merrigan, Rogers, & Goldberg, 2011). Results of an unpublished study of teachers' reports of their school gardens found that the gardens were consistently used to support science, math, language arts, social studies, physical education, and art curricula (Wagenfeld & Whitfield, submitted for publication).

Gardening as a Part of Our "Normalcy"

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According to Gillen, "our normalcy is the way in which the repetitive practice of real world activity has the potential to improve motor function and occupational performance, [and to] remodel and reorganize people's brains" (2013, p. 646). Our "normalcy" can be applied to the art and science (and practice) of gardening as an occupational therapy intervention. "Normalcy" can be established, in part, by validating that gardening as a client-centered occupation has meaning and purpose for some clients. Based on expertise in task analysis and adaptation, there is opportunity to promote the idea that occupational therapy practitioners are uniquely qualified to implement therapeutic gardening. Doing so entails engaging in applied or translational research, which allows research findings to translate directly to clinical treatment in order to implement evidence-based practice (O'Connor, 2013). Translational research can affirm the efficacy of gardening as a meaningful and purposeful intervention and the health benefits of engaging clients in gardening.

The roots of gardening as a meaningful and purposeful intervention for some clients is nothing new, and follows Gillen's suggestions to use "authentic occupations in the clinic" and move away from the model of "therapists doing" to the model of "client's doing"; the model with which our profession began (2013, p. 649). Gardening is one intervention that our profession can fully embrace. If, as Gillen (2013) suggests, the profession needs to embrace our roots and return to our normalcy, engaging clients in gardening-based activities is a meaningful and purposeful way to find that normalcy.

Methods

Participants

Ninety-one occupational therapy practitioners initially responded to an online invitation to participate in a survey looking at the use of gardening as a therapy intervention. Of that group, 10 responded only to demographic questions and one to no questions. Of the remaining 80 participants, 20 indicated that they did not use gardening with their clients and were asked to discontinue the study. The remaining 60 responded to specific questions about using gardening as a therapeutic intervention. Thus, the results particular to the use of gardening as an occupational therapy intervention are reported based on a respondent pool of 60 participants.

Procedures

The Western Michigan University Human Subjects Institutional Review Board approved this study. A nonprobability convenience sampling technique was used to generate the respondent pool for the study. An email containing a short description of the study and a link to the Survey Monkey© site was submitted to alumni of the Western Michigan University (WMU) Occupational Therapy program, whose email addresses are on file with the WMU Office of Development. The alumni were invited to participate in the study and to share information about the study with other occupational therapy practitioners. The initial email blast was sent in mid-November, 2013 and a follow-up email was sent in mid-January, 2014. Information about

the study was also posted on four OT Connections Groups (General Forum, Research Forum, Geriatric Forum, and Pediatrics Forum) and the AOTA LinkedIn site in November, 2013. Data was collected between mid-November, 2013, and late February, 2014.

Instruments

The authors designed a short 15-question survey looking at the use of gardening as an occupational therapy intervention. The first author is an experienced gardener who maintains a therapeutic garden design consultation practice. The second author is also an experienced gardener and researcher. Both hold academic positions. The study was purposely kept short to encourage a higher participation rate. Fourteen of the survey questions were forced choice and one was open ended. The questions were designed to examine whether and how occupational therapy practitioners use gardening as a therapy intervention and what, if any, features in the garden support or impede participation. The survey also sought to examine whether (if present), the facility garden where occupational therapy practitioners work (or, if doing home care, their client's garden) met the needs of both clients and practitioners. The open-ended question invited respondents to share their favorite story involving the use of gardening with a client. The survey was posted on Survey Monkey©.

Data Analysis

Descriptive statistics and a contingency analysis using Pearson's chi-square with significance at .05 were used to interpret the data for the closed-ended question by means of SPSS Version 21. A content analysis was completed on the open-ended question. It was then sorted into categories based on occupational therapy practitioners' responses.

Results

Of the initial pool of 91 respondents who answered the question about general demographic information, 92.86% (n = 65) identified as being occupational therapists and 7.14% (n = 5) identified as being occupational therapy assistants. Of the 67 who answered a question about geographical location, 55.22% (n = 37) of the respondents reported working in the Midwest, 25.37% (n = 17) of the respondents reported working in the South, 8.96% (n = 6) of the respondents reported working in the North, 7.46% (n = 5) of the respondents reported working in the West, and 2.99% (n = 2) of the respondents reported working in the East. In terms of years of practice, of the 81 respondents who answered the question, 43.21% (n = 35) reported more than 20 years of practice, 13.58 (n = 11) reported 16-20 years and 0-2 years of practice, 12.35% (n = 10) reported 11-15 years and 3-5 years of practice, and 4.94% (n = 4) reported 6-10 years of practice. Responses show that 87.32% (n = 62) of the respondents heard about the survey through direct email contact and 12.68 (n = 9) through other means, such as from a colleague (snowball effect) or the OT Connections or AOTA LinkedIn groups.

When asked if the occupational therapy practitioner uses garden/gardening-related activities with clients, a total of 11 did not further participate in the survey. Of the remaining 80 respondents, 75% (n = 60) indicated yes and 25% (n = 20)

indicated no. If a respondent answered no, they were asked to discontinue taking the survey, leaving a core group of 60 participants. For the 60 who responded affirmatively to using gardening with clients, the following findings were generated.

Of the 60 respondents who answered the question about their primary areas of practice, 58.33% (n = 35) indicated rehabilitation, disability, and participation; 21.67% (n = 13) indicated children and youth; 10% (n = 6) indicated both productive aging and education and management; and 0% indicated both health and well-being and work and industry. The 59 respondents who answered the question about practice settings included inpatient adult rehab (22.03% [n = 13]); skilled nursing facility (16.95% [n = 10]); academia (11.86% [n = 7]); school system (10.17% [n = 6]); adult rehab outpatient (8.47% [n = 5]); private practice (6.8% [n = 4]); community health, home health, and adult inpatient mental health (5.08% [n = 3], each); early intervention (3.39% [n = 2]); and inpatient and outpatient pediatric physical rehab and youth mental health outpatient (1.7% [n = 1]) per category. For the 52 who responded to a question asking how often they engage clients in garden/gardening-related activities, 5.77% (n = 3) indicated daily, 15.38% (n = 8) indicated weekly, 9.62% (n = 5) indicated every other week, 7.69% (n = 4) indicated monthly, 5.77% (n = 3) indicated every other month, 23.08% (n = 12) indicated quarterly, and 32.69% (n = 17) indicated yearly.

With regard to the 52 participants who responded to both the question about frequency of gardening and practice setting, there was a statistically significant relationship ($x = 122.74$, $p = .015$) between practice setting and frequency of use of gardening as an occupational therapy intervention (see Table 1). Those indicating working in the practice settings of adult inpatient physical rehabilitation (n = 13), skilled nursing care (n = 10), academia (n = 7), and school system practice (n = 6) used gardening as an intervention or teaching tool most frequently with their clients or students.

Table 2 reports the environmental context for the 58 practitioners who responded to the question regarding where they work with gardening as an occupational therapy intervention.

When asked what garden/gardening-related activities in which the practitioners engage their clients, the 60 respondents indicated overwhelmingly that watering and planting were the primary activities. A summary of garden/gardening-related activities can be found in Table 3.

Of the 60 practitioners who responded to the question about why they use gardening as an occupational therapy intervention, overwhelmingly the responses supported a client-centered approach to treatment. Gardening was selected because it was determined to be meaningful, purposeful, fun, and beneficial for a client. A summary of the findings can be found in Table 4.

When asked if the respondents worked in a garden with their client and whether the practitioner helped to design the garden, 42 participants responded to the question. Of this group, 21.42% (n = 9) indicated that they did help to design the

garden and 78.57% (n = 33) indicated they did not help design the garden. The association between whether an occupational therapy practitioner helped to design the garden and the frequency of using gardening as a therapeutic intervention was significant (x= 17.80, p = 007). Practitioners who helped to design the garden used it more frequently than those practitioners who did not (Table 5).

Table 1

Relationship between Frequency of use of Gardening as an Occupational Therapy Intervention and Practice Setting

		Frequency									
		No response	Daily	Weekly	Twice Monthly	Monthly	Bimonthly	Quarterly	Yearly	Total	*p*
Practice Setting		1	0	0	0	0	0	0	0	1	
	1	0	0	2	2	1	1	5	2	13	
	2	2	0	1	0	1	0	0	1	5	
	3	2	0	1	0	0	0	5	2	10	
	4	0	1	0	0	0	0	0	0	1	
	5	0	0	0	0	0	0	0	1	1	
	6	0	2	0	1	0	0	0	0	3	
	9	0	0	0	1	0	0	0	0	1	
	10	0	0	1	0	1	0	1	0	3	
	12	1	0	1	0	0	1	0	1	4	
	13	1	0	0	1	1	0	0	3	6	
	14	0	0	0	0	0	0	0	2	2	
	15	1	0	0	0	0	1	1	4	7	
	16	0	0	2	0	0	0	0	1	3	
Total		8	3	8	5	4	3	12	17	60	.015

Note. 1 = Adult rehab inpatient; 2 = Adult rehab outpatient; 3 = Skilled nursing facility; 4 = Children/youth rehab inpatient; 5 = Children/youth rehab outpatient; 6 = Adult mental health inpatient; 7 = Adult mental health outpatient; 8 = Children/youth mental health inpatient; 9 = Children/youth mental health outpatient; 10 = Community health; 11 = Day treatment program; 12 = Private practice; 13 = School system; 14 = Early intervention; 15 = Academia; 16 = Home health.

Table 2

Distribution Rate of Environmental Contexts where Gardening as Occupational Therapy Intervention Occurs

Outdoors in a garden	58.62%	n = 34
Indoors in the clinic	48.28%	n = 28
Outdoors, but not in a garden	24.14%	n = 14
Classrooms	12.07%	n = 7
Client rooms	5.17%	n = 3

Table 3

Garden/Gardening-Related Activities in Rank Order of Preference

Watering	86.89%	n = 53
Planting	83.61%	n = 51
Weeding	47.54%	n = 29
Pruning	42.26%	n = 27
Harvesting	36.07%	n = 22
Crafts	36.07%	n = 22
Cooking	26.23%	n= 16
Large scale garden maintenance	13.11%	n = 8
Journaling	6.56%	n = 4
Vocational activities	6.56%	n = 4

Table 4

Why Gardening is used as an Occupational Therapy Intervention

Meaningful and purposeful for client	93.66%	n = 56
Motivating for client	80%	n = 48
Fun for client	61.67%	n = 37
Good exercise for client	36.67%	n = 22
Client request	31.67%	n = 19
Reported health benefits	31.67%	n = 19
Educational	21.67%	n = 13
Jobs skills training	8.33%	n = 5
OT practitioner likes to garden	38.23%	n = 33

Table 5

Frequency of Gardening and Practitioner Involvement in Garden Design

	Did practitioner help design garden			
	No	Yes	Total	*p*
Frequency of gardening				
Daily	0	3	3	
Weekly	6	1	7	
Twice Monthly	4	1	5	
Monthly	3	1	4	
Bimonthly	0	1	1	
Quarterly	10	0	10	
Yearly	10	2	12	
Total	33	9	42	*.007*

Further, there was a statistically significant relationship between practice setting and rate of involvement in the design of the garden ($x = 40.91$, $p = .032$). Practitioners working in adult inpatient rehabilitation (n = 8) or outpatient rehabilitation (n = 5) or in skilled nursing care (n = 8) were more likely to have been involved with the facility garden design (see Table 6) and also used gardening as an occupational therapy treatment intervention most frequently.

Table 6

Relationship Between Practice Setting and Involvement in Design of the Garden

Practice setting	No response	Did not help to design	Helped to design	Total	*P*
No response	0	0	1		
1	4	1	8		
2	0	0	5		
3	2	0	8		
4	0	1	0		
5	0	0	1		
6	0	3	0		
7	0	0	0		
8	0	0	0		
9	0	0	1		
10	0	1	2		
11	0	0	0		
12	0	3	1		
13	2	1	3		
14	0	0	2		
15	2	1	3		
16	0	3	0		
Total	10	11	39	60	*.032*

Note. 1 = Adult rehab inpatient; 2 = Adult rehab outpatient; 3 = Skilled nursing facility; 4 = Children/youth rehab inpatient; 5 = Children/youth rehab outpatient; 6 = Adult mental health inpatient; 7 = Adult mental health outpatient; 8 = Children/youth mental health inpatient; 9 = Children/youth mental health outpatient; 10 = Community health; 11 = Day treatment program; 12 = Private practice; 13 = School system; 14 = Early intervention; 15 = Academia; 16 = Home health.

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A follow up question was to select the best and most challenging features of their facility garden. Forty-five respondents answered the question regarding the best features and 41 answered the question regarding the most challenging features. The top five responses pertaining to the positive and the most challenging features are summarized in Table 7.

Table 7

Occupational Therapy Practitioner Interpretation of the Best (+) and Most Challenging (-) Features of their Facility Garden

Garden feature	+ or -	%	n
Close to clinic	+	46.67	21
Varied walking surfaces	+	40	18
Pathways are level	+	28.89	13
Pathways are not level	-	17.07	7
Pathways are wide enough	+	37.78	17
No railings	-	12.20	5
Plantings are appealing/sensory appeal	+	51.11	23
Plants are not labeled	-	17.07	7
Places to sit and work	+	55.56	25
No places to sit and work	-	19.51	8
Seating and table options do not allow for flexibility	-	12.20	5
Clients can help tend the garden	+	55.56	26
Raised beds/planters	+	55.56	23
Clients cannot sit and work in the garden safely and comfortably	-	12.20	5
Well-maintained	+	24.44	11
Attracts butterflies and insects	+	37.78	17

When asked to share a favorite story about using gardening as an intervention, the predominant themes that emerged from a content analysis of the stories were as follows: Gardening as an occupational therapy intervention was (a) client centered, (b) provided for a sense of accomplishment, (c) functioned as an antidote for depression, (d) offered connection to the earth and with the practitioner, (e) was therapeutic, and (f) was meaningful and purposeful. Of the 54 stories

shared, four are particularly noteworthy in acknowledging the meaning and purpose of gardening.

> "Seeing a client engage in an activity that is meaningful to them! I had a client who was just not enjoying OT. I found out that [the client] enjoyed gardening and we had a gardening activity planned with the [recreational therapist] that week. The client loved it because [the group] was weeding, harvesting, and then using produce to make salsa. [The client] loved being outside for an hour. I loved it because the client was addressing activity tolerance, balance, daily living skills, endurance, and so on. And the client enjoyed OT much more after the activity!"

> "I had a patient who [had a stroke] who was not "thrilled" to come to therapy. When one of his children told us about his work in a community garden in our area we were able to fully engage him in his therapies through him "teaching" us about and how to plant various vegetables that he would [grow] in the community [garden]. Motivation improved, participation increased, and the patient demonstrated improvements functionally so that he was able to transition home from our rehab."

> "I initially started gardening with an 8 year old boy to decrease his tactile defensiveness. The gardening did help with this goal, but more importantly the little boy took great pride in his plants and this was very meaningful to him. His overall participation and cooperation during therapy improved immensely."

> "A client, who had a hip replacement and a previous head injury and couldn't talk, wanted me to come out to his backyard to show me something. I followed him to his garage where he motioned to me to get two chairs, one for me and one for him, next to the raised garden. He sat down and leaned toward his operated side safely and showed me that he could reach down to pull weeds and enjoy his yard again. I had no idea that this was his interest, and he smiled when I applauded his effort."

Discussion

Reid states that, "occupational engagement occurs in environmental contexts" (2011, p. 52). A just right environment contains four conditions: affirmation, an element of choice and self-determination, a provision of private and community space, and a physically and emotionally safe environment in which to participate (Rebeiro, 2001). Occupational therapy practitioners are well aware of how environmental contexts can facilitate or impede performance and participation for the clients with whom we work (Baum & Christiansen, 2005; Kielhofner, 1995; Law et al., 1996). This is evidenced through occupational therapy theories, models, and frameworks, such as the Person-Environment-Occupation-Performance Model (Christiansen & Baum, 2005), the Canadian Model

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of Occupational Performance (Law et al., 1996), and Occupational Adaptation (Schkade & McClung, 2001). Environments that provide a range of opportunities are the most conducive for implementing interventions that support the just right challenge and flow. The state of being completely immersed and engaged in a personally meaningful and purposeful activity that is not so hard as to be daunting, but hard enough to align with an individual's abilities (the just right challenge) (Csikszentmihalyi, 1998) creates mindfulness, or "paying attention on purpose" (Reid, 2011, p. 51). These environments set the stage for implementation of best practice treatment (Kielhofner, 1995).

In the Occupational Participation and Engagement with Nature (OPEN) Model (Wagenfeld, 2013), it is proposed that gardening (nature-based) activities are best experienced in environmental contexts that are universally designed. Universal design entails the creation of products, services, and environments that are usable by the widest range of people possible regardless of age, ability, culture, or preference (Connell et al., 1997). The salient findings of the current study support the intention of the OPEN Model. Environmental context does matter to the practitioners who participated in the study. Features that support active engagement—to see, to do, and to experience—are important in a garden. This includes having the garden located close to the therapy clinic, and having wide and level pathways, flexible places to sit and work, hand railings along the pathways, the just right balance between the sun and shade, appealing plantings that are available for clients to tend, and easy to read plant labels, all of which support active engagement and heighten the meaningfulness and purposefulness of gardening. Environments that support active engagement and meaning are motivating and fun. Universally designed environmental contexts, including gardens, can support occupational engagement, and subsequently, flow, the just right challenge, and mindfulness. The importance of a just right environment is paramount to enhance the effectiveness of this time-honored activity.

While it is evident from this study that occupational therapy practitioners use gardening as an intervention in highly evidence-based climates, such as health care and education (Müllersdorf & Ivarsson, 2012), there is a paucity of evidence from the profession validating its effectiveness. Further, there is a disconnection within the profession in translating this intervention into measurable outcomes. In order for practitioners to facilitate the "most effective interventions, occupational therapy interventions must be defined, described, and tested so that practitioners know what is effective for which clients" (AOTA, 2011, p. S4). Because occupational therapy is founded on the concept that engaging in occupation significantly contributes to health and wellness, it appears that there is ample room for the voice of the profession to be heard in measuring the positive implications of gardening as an occupation and therapeutic intervention.

Limitations

The intention of this study was to survey a convenience sample in order to guide further study

of the effectiveness of occupational therapy practitioner implementation of gardening as a meaningful and purposeful intervention for clients and patients across all practice areas. A potential limitation may be that many occupational therapy practitioners do not subscribe to LinkedIn or AOTA OT Connections groups and some do not read or receive emails. Accordingly, some practitioners who use gardening as an intervention may not use the Internet or participate in online communities. It remains a challenge to determine how to reach a larger range of practitioners.

Implications for Occupational Therapy Practice

Fieldhouse suggests that practitioners "cannot bestow meaning on occupations used in therapy" (2003, p. 287). Rather, meaning must derive from client-centered therapy. Results of this study support this contention. Occupational therapy practitioners were nearly twice as likely to use gardening as an occupational therapy intervention because it is a meaningful, purposeful, and motivating activity for their clients, rather than because the practitioner likes to garden.

There is a need to acquire an evidence base of the clinical effectiveness, meaning, and purpose of gardening as an occupational therapy intervention based on the positive health benefits that have been identified with engagement in it. The results of the pilot survey along with AOTA's priority for translational, intervention, and health services research (2011) suggests that further rigorous randomized controlled trial research to evaluate the effectiveness and efficacy of gardening as a client-centered, meaningful and purposeful activity for occupational therapy and our engagement in the design of the garden is warranted. Equally as important, phenomenological research endeavors will help to elucidate the meaning and value that gardening as a therapeutic intervention provides to the clients with whom we work.

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